

# Rafael Silva

420 S. Green Valley Drive, Naperville, IL 60540 • (630) 357-9025 • [mechanical\\_engineer@wowway.com](mailto:mechanical_engineer@wowway.com) • <http://home.fnal.gov/~rafael>

---

## SUMMARY

Mechanical engineer with Master's degree in Materials, dedicated, versatile, organized, creative, efficient and able to convey technical concepts to non-technical audiences. More than 18 years of professional experience, including 14 years in mechanical design and 2 years in technical inspections. Responsible for many successfully completed projects, totaling more than \$2 million.

---

## PROFESSIONAL EXPERIENCE

### **Fermilab - Fermi National Accelerator Laboratory - IL, USA / Mechanical Engineer** *Sep 91 – present*

Responsible for:

- Mechanical design of equipment for high-energy physics research, including sub-atomic particle detectors, ranging in size from inches to yards, with design tolerances of thousandths of an inch, constantly interfacing with multi-disciplinary personnel, dealing with limited resources, shifting priorities, and tight schedules.
- Design, construction, and installation of: 36 structures (including supports, stands, frames, and lifting fixtures, with weights from pounds to tons); 10 mechanisms (including assembly, soldering, and gluing fixtures); 1 pneumatic system; 4 electromechanical systems (including positioning systems); 3 water systems; 2 gas systems; 2 pressure vessels; 12 pressure vessel safety relief systems; and 10 gas bags.
- Performed analyses of: 26 structures (including 4 “below-the-hook” lifting devices); 1 vacuum vessel; 4 small diameter piping systems; and 1 IC board water cooling system.
- Conducted reviews of: 6 structural analyses (including 3 “below-the-hook” lifting devices); and 16 pressure vessels safety relief analyses.

Experience in all phases of a project, from conception to commissioning:

- Supervised the work of engineers, designers, drafters, technicians, and co-ops.
- Coordinated efforts of affiliates from different collaborating institutions.
- Developed procedures, formal technical reports, specifications, timelines, costs and manpower estimates.
- Planned assembly, testing, inspection, installation, and alignment of mechanical equipment.
- Conducted research work on plastic sheets, metal plates, as well as welded and bolted connections.
- Designed, constructed, tested, and evaluated prototypes.
- Checked and approved layouts, fabrication drawings, and P&ID's.
- Researched, tested, and selected several fabrication techniques, including milling, plasma cutting, water jet machining, electrical discharge machining, thread rolling, injection molding, and extrusion.
- Specified several surface finishes including nickel plating, hard coating, and powder coating.
- Selected fabricators; specified and purchased off-the-shelf and custom components.

Volunteer work:

- Coordinated cultural events for Fermilab's Art and Lecture Series.

### **BV - Bureau Veritas - RJ, Brazil / Mechanical Engineer**

*Apr 86 - Feb 88*

- Verified compliance with contractual technical specifications for materials and fabrication of industrial equipment, pressure vessels, vehicles, and structures.
- On-site inspections of off-shore platforms, refineries, chemical plants, shipyards, factories, and shops, performed in more than 60 companies.
- Conducted mechanical, hydrostatic, pneumatic, flow, explosion, combustion, and performance tests.
- Qualified welding procedures and welders; performed and evaluated results of NDT.

# Rafael Silva

420 S. Green Valley Drive, Naperville, IL 60540 • (630) 357-9025 • mechanical\_engineer@wowway.com • <http://home.fnal.gov/~rafael>

---

## PROFESSIONAL EXPERIENCE (CONTINUED)

### Carbrasmar - RJ, Brazil / Mechanical Engineer

*Dec 85 - Mar 86*

- Designed and selected components for fiberglass fire-proof lifeboats.

### Montreal Engenharia - RJ, Brazil / Engineer Trainee

*Mar 85 - Nov 85*

- Supervised construction and installation of pipelines and reservoirs in a petrochemical plant.

### Shell Petroleum - RJ, Brazil / Co-op

*Jun 84 - Jan 85*

- Assisted on supervision of construction and installation of reservoirs in refineries.

---

## EDUCATION

### M.S., Materials and Metallurgical Engineering

*Mar 88 - Aug 91*

Federal University of Rio de Janeiro, COPPE/UFRJ, Brazil

- Emphasis in mechanical properties of materials.
- Thesis in Fracture Mechanics involving methodology of CTOD and  $J_{Ic}$  tests by multi-specimen and unloading compliance methods.
- Developed software interfacing a PC with an INSTRON mechanical test machine to perform data acquisition and analysis of the CTOD and  $J_{Ic}$  tests performed.
- Award: M.S. fellowship, Brazil Department of Education, full-time student.

### B.S., Mechanical Engineering

*Mar 80 - Feb 85*

Federal University of Rio de Janeiro, UFRJ, Brazil

- Emphasis in fluid and thermal sciences.

Both degrees accredited by World Education Services, New York, NY.

---

## TRAINING

- University of Wisconsin - Madison, WI: Structural Steel Design course
- College of DuPage, Glen Ellyn, IL: Machine Shop course.
- HSB Global Standards, Hartford, CT: Pressure Vessels.
- SDRC I-DEAS, Oak Brook, IL: Parts Design, Pre and Post Processing, and Linear Solvers training.
- FERMILAB, Batavia, IL: I-DEAS; crane, forklift, and scissors lift operation; ODH and radiation training.

---

## SKILLS

- Experienced in designing according to AA, AISC/ASD, AWS, ASME sec.VIII Div.1, and ASME B30.20.
- Familiar with various international standards such as BV, ASTM, ASME sec.VIII Div.2 and sec.IX, UL, SOLAS, AFNOR, ISO, ABNT, and PETROBRÁS.
- Versed in ANSI Y14.5, Geometric Dimensioning and Tolerancing.
- Skilled user of I-DEAS CAD software: 2D drafting, 3D solid modeling and FEA simulation.
- Proficient in Microsoft Office Suite, Mathsoft Mathcad, and Roark & Young on TKsolver.

---

## LANGUAGES

- Portuguese, English: fully fluent; excellent oral and written communication skills.
- Spanish: very good reading, understanding, and speaking skills.
- French, Italian: technical reading.